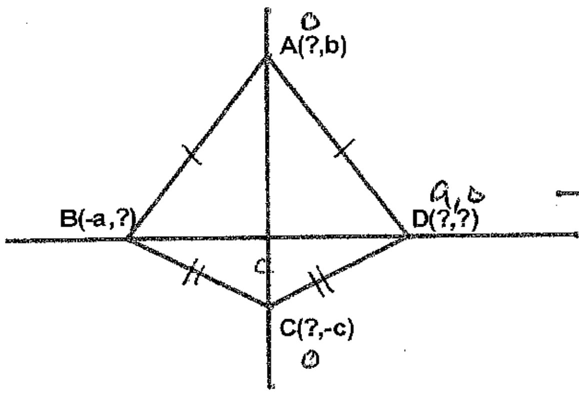
#3 Rt ∠

Name Key Skip 7 + 8

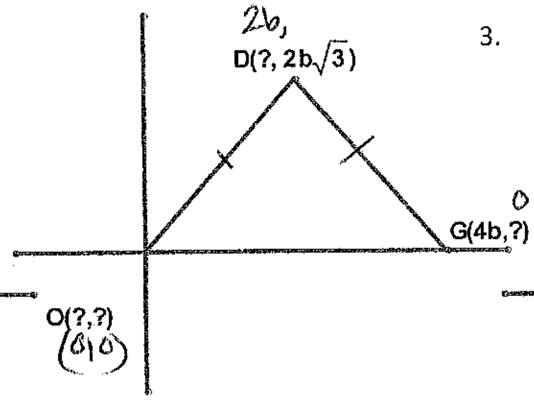
5.1 Coordinate Geometry WS

What are the coordinates of the following figures?

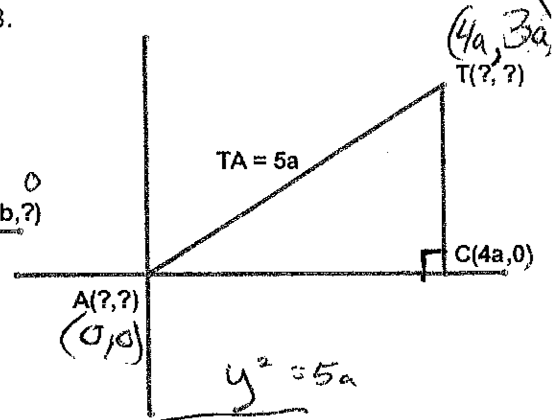
1.



2.



3.



$y^2 = 5a$

$\sqrt{4a^2 + y^2} = 5a$

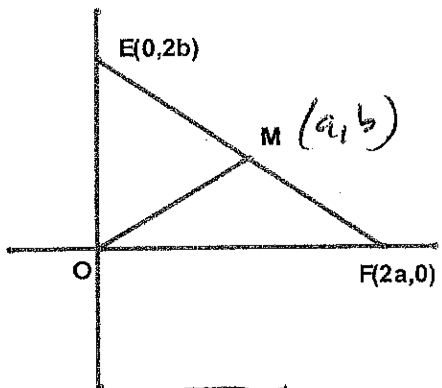
$16a^2 + y^2 \quad 25a^2$

$\sqrt{9a^2} = 3a$

4. Given: ΔOEF is a right triangle.

M is the midpoint of $\overline{EF}$.

Prove: EM=FM=OM.



$EM = \sqrt{(-a)^2 + (2b-b)^2}$ ✓

$EM = \sqrt{a^2 + b^2}$ ✓

$FM = \sqrt{(2a-a)^2 + (0-b)^2}$ ✓

$= \sqrt{a^2 + b^2}$ ✓

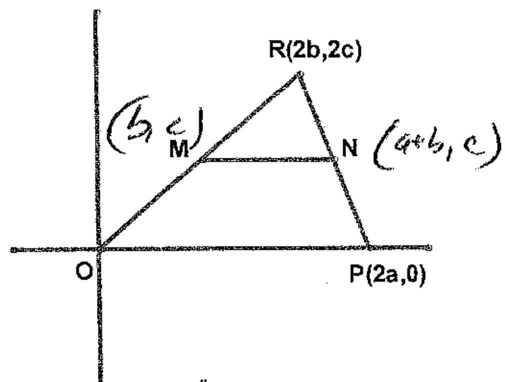
$OM = \sqrt{(a-0)^2 + (b-0)^2}$ ✓

$OM = \sqrt{a^2 + b^2}$ ✓

$\boxed{EM = FM = OM}$

5. Given: $\overline{MN}$ is the midsegment of ΔORP

Prove: $\overline{MN} \parallel \overline{OP}$, MN = $\frac{1}{2}$(OP)



$\overline{MN} \quad m = \frac{c-c}{a+b-b} = 0$

$\overline{OP} \quad m = \frac{0-0}{2a-0} = 0$

$\overline{MP} \parallel \overline{OP}$ b/c same slope

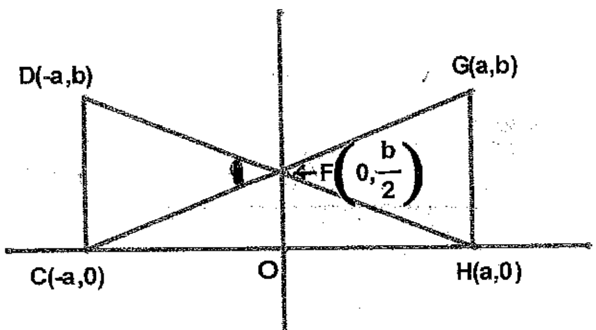
$MN = \sqrt{(a+b-b)^2 + (c-c)^2} = a$

$OP = \sqrt{(2a-0)^2 + (0-0)^2} = 2a$

$\boxed{a = \frac{1}{2} 2a \therefore MN = \frac{1}{2} OP}$

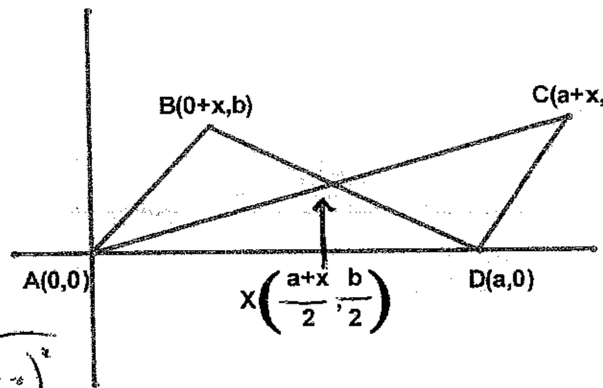
6. Given: diagram

Prove: ΔFGH≅ΔFDC



7. Given: diagram

Prove: ΔABX≅ΔCDX



$FD = \sqrt{(0 - -a)^2 + \left(\frac{b}{2} - b\right)^2}$

$\sqrt{a^2 + \frac{b^2}{4}}$ ✓

$CF = \sqrt{(0 - -a)^2 + \left(\frac{b}{2} - 0\right)^2}$

$CF = \sqrt{a^2 + \frac{b^2}{4}}$ ✓

$FG = \sqrt{(a-0)^2 + \left(b - \frac{b}{2}\right)^2}$

$FG = \sqrt{a^2 + \frac{b^2}{4}}$ ✓

$HF = \sqrt{(a-0)^2 + \left(0 - \frac{b}{2}\right)^2}$

$HF = \sqrt{a^2 + \frac{b^2}{4}}$ ✓

$CF = HF$ ✓

$FD = FG$

$DC = \sqrt{(-a - -a)^2 + (b-0)^2}$ $GH = \sqrt{(a-a)^2 + (b-0)^2}$

$DC = b$ $GH = b$

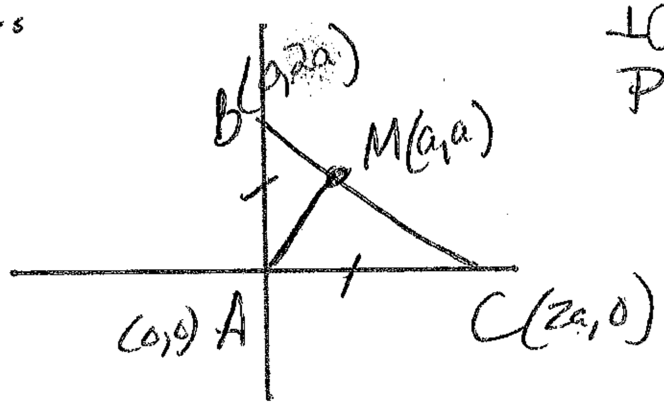
$DC = GH$ ✓

$\therefore \Delta FGH \cong FDC$ by SSS

Isosceles

8. Write a coordinate proof for the statement: ~~The measure of the~~ segment that joins the vertex of the right angle in a right triangle to the midpoint of the hypotenuse is one-half the measure of the hypotenuse.

Notes



G: Isosceles Rt Δ w/ Midpt of hypotenuse

P: $\overline{AM} \perp \overline{BC}$

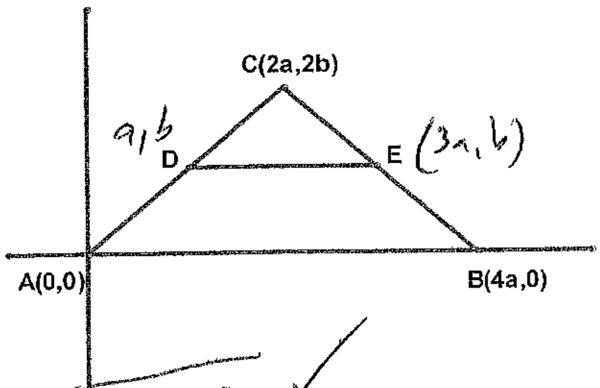
$\overline{AM}$ $m = \frac{a-0}{a-0} = \frac{a}{a} = 1$

$\overline{BC}$ $m = \frac{2a-0}{0-2a} = \frac{2a}{-2a} = -1$

$\overline{AM} \perp \overline{BC}$ b/c slopes are opposite Reciprocals

9. Given: $\overline{DE}$ is the midsegment of isosceles ΔABC.

Prove: $\overline{AD} \cong \overline{BE}$



$AD = \sqrt{a^2 + b^2}$ ✓

$BE = \sqrt{(4a-3a)^2 + (0-b)^2}$

$\sqrt{a^2+b^2}$ ✓

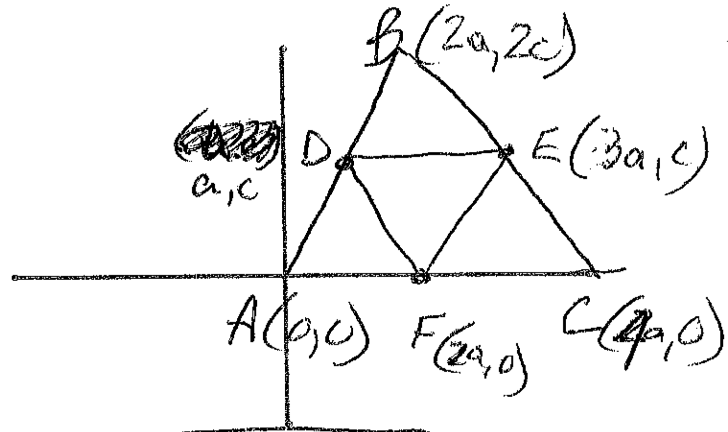
$AD = BE$

$\therefore \overline{AD} \cong \overline{BE}$

10. Given: ΔABC is isosceles.

$\overline{DE}$, $\overline{DF}$, and $\overline{EF}$ are midsegments of ΔABC.

Prove: ΔDEF is isosceles. (Draw your own diagram!)



$EF = \sqrt{(3a-2a)^2 + (c-0)^2}$

$\sqrt{a^2 + c^2}$ ✓

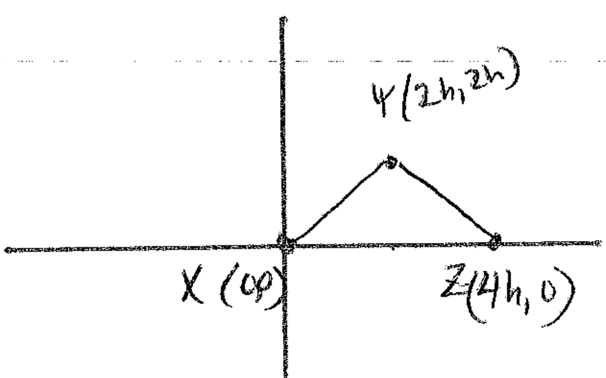
$DF = \sqrt{(a-2a)^2 + (c-0)^2}$

$DF = \sqrt{a^2 + c^2}$ ✓

ΔDEF is isosceles b/c $EF = DF$

Draw ΔXYZ and determine whether it is a right triangle.

11. X(0,0) Y(2h,2h) Z(4h,0)



$\overline{XY}$ $m = \frac{2h-0}{2h-0} = 1$

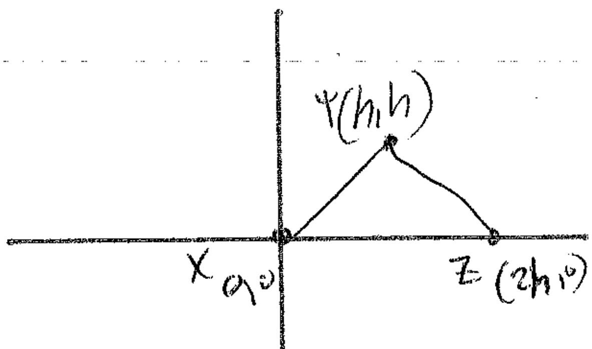
yes

$\overline{XY} \perp \overline{ZY}$

$\overline{ZY}$ $m = \frac{2h-0}{2h-4h} = \frac{2h}{-2h} = -1$

b/c slopes are opposite reciprocals

12. X(0,0) Y(h,h) Z(2h,0)



$\overline{XY}$ $m = \frac{h-0}{h-0} = 1$

yes

$\overline{YZ} = \frac{h-0}{h-2h} = \frac{h}{-h} = -1$

same